

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1, 2, 5-9 and 11, 12, 14 and 22 are pending. By this Amendment, claims 15-21 have been canceled without prejudice to filing them in a continuing Application. Claims 3, 4, 10 and 13 are also canceled. Claims 1, 6 and 12 are independent. Claims 1, 7, 12 and 22 are amended. Reconsideration of this application, as amended, is respectfully requested.

Support for the additional material in claim 1 is found in Applicants originally filed disclosure including, for example, Fig. 4E, which shows storage electrode 165 directly contacting gate insulator layer 130.

Support for the additional material in claim 12 is found in Applicants' originally filed disclosure including, for example, in Fig. 6D, which shows pixel electrode 281 formed directly on the gate insulator layer 230 and ion contact with side portions of the semiconductor layer 241 and ohmic contact layer 252.

Reason for Entry of Amendments

The amendments to the claims clearly distinguish over the applied art, thereby placing the Application in condition for allowance.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 1, 2, and 5 are rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,414,730 to Akamatsu et al. (hereinafter, "Akamatsu") in

view of U.S. Patent 5,926,235 to Han et al. (hereinafter, "Han"). These rejections are respectfully traversed.

Because the rejection is based on 35 U.S.C. §103, what is in issue in such a rejection is "the invention as a whole," not just a few features of the claimed invention. Under 35 U.S.C. §103, "[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The determination under §103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. See In re O'Farrell, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). In determining obviousness, the invention must be considered as a whole and the claims must be considered in their entirety. See Medtronic, Inc. v. Cardiac Pacemakers, Inc., 721 F.2d 1563, 1567, 220 USPQ 97, 101 (Fed. Cir. 1983).

In rejecting claims under 35 U.S.C. § 103, it is incumbent on the Examiner to establish a factual basis to support the legal conclusion of obviousness. See, In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the Examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one of ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed

invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal Inc. v. F-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the Examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. Note, In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

A showing of a suggestion, teaching, or motivation to combine the prior art references is an "essential evidentiary component of an obviousness holding." C.R. Bard, Inc. v. M3 Sys. Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). This showing must be clear and particular, and broad

conclusory statements about the teaching of multiple references, standing alone, are not "evidence." See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999).

The Office Action clearly, unmistakably and unequivocally admits that Akamatsu does not disclose a storage capacitor including a part of the gate line as a first storage electrode, a portion of the gate insulation layer, and a second storage electrode having an island shape, wherein the first storage electrode is formed of the same material as the gate electrode and the second storage electrode is formed of the same material as the source and drain electrodes.

In an attempt to remedy this admitted deficiency, the Office Action turns to Han, which discloses a storage capacitor including a part of the gate line as a first storage electrode, a portion of the gate insulation layer, and a second storage electrode having an island shape, wherein the first storage electrode is formed of the same material as the gate electrode and the second storage electrode is formed of the same material as the source and drain electrodes.

The alleged motivation to modify Akamatsu by including the storage capacitor of Han is "for the purpose of increasing the response time of the pixels by allowing localized signal storage."

Applicants respectfully submit that this is not a demonstration of proper motivation to combine the applied references as suggested.

Akamatsu already discloses localized signal storage. See, for example, Fig. 12, which clearly shows localized signal storage capacitors 3. The Office Action

fails to demonstrate that a skilled worker would desire to modify Akamatsu to provide localized signal storage because Akamatsu already provides such a feature.

In response to this argument, which was presented in the Amendment filed on July 13, 2004, the Examiner argues that Fig. 12 of Akamatsu is not the invention of Akamatsu, but is a conventional active matrix configuration. Applicants do not disagree with this characterization of Akamatsu as far as it goes. However, Akamatsu's invention is directed to providing a liquid crystal display device in which wiring with a low resistance metallic material is used and in which pixel electrodes and drain extraction electrodes can be reliably connected, and a method of manufacturing the same (col. 4, lines 35-40). By disclosing that a conventional active matrix display configuration includes storage capacitors, Akamatsu is indicating to one of ordinary skill in the art that Akamatsu's disclosed reliable connection materials and methods can be used to improve such conventional devices. Akamatsu does not contain any disclosure of removing the disclosed capacitances to improve them. Akamatsu merely improves conventional active matrix devices, including that shown in Fig. 12, by using the disclosed reliable connection materials and methods.

Accordingly, the assertion by Applicants that the Office Action fails to demonstrate that a skilled worker would desire to modify Akamatsu to provide localized signal storage because Akamatsu already provides such a feature, overlooks the disclosed conventional examples to which Akamatsu's

improvements are directed, including active matrix devices that provide localized signal storage.

As pointed out above, a showing of proper motivation must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not "evidence." See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999). The statement "for the purpose of . . . allowing localized signal storage" is nothing more than a broad conclusory statement about both Akamatsu and Han, and does not constitute evidence of proper motivation to provide the storage capacitor features of Han for Akamatsu.

The Examiner takes issue with this assertion, which was presented in the Amendment filed on July 13, 2004, by stating that the alleged motivation "clearly recites a specific advantage/improvement resulting from the proposed combination and is therefore not a 'broad conclusory statement.'"

Applicants respectfully disagree.

In the first place, the Office Action does not provide any evidence that Akamatsu's device needs more local storage than it already has, or that one would be motivated to modify Akamatsu to provide storage electrodes on ohmic contact layers (i.e., metal-semiconductor contact layers with a linear current-voltage characteristic and low resistance), as required by Han. In this regard, Applicants respectfully note that Han clearly discloses that the storage electrodes are formed on an ohmic contact layer. (Abstract, claims 3 and 11, col. 3, lines 1-14, etc.).

In the second place, the Office Action provides no objective factual evidence that the proposed modification of Akamatsu by Han will result in any improvement in Akamatsu in any way, including the speculative improvement of decreased pixel response time. The Office is tasked with providing objective factual evidence in support of its conclusions, but none has been presented in support of this speculative conclusion.

Similarly, the "response to arguments" section of the Office Action concludes that "[H]aving storage capacitors in LCD pixels to increase switching speeds/decrease switching time is extremely common and well known in the art."

No objective factual evidence has been presented to support this conclusion, as required by existing case law. A factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002). This underscores the failure of the Office Action to comply with existing case law requirements for supporting a rejection under 35 U.S.C. §103.

Additionally, the Examiner may not pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc., 796 F.2d 443, 448, 230 USPQ 416, 419 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987) and In re Kamm, 452 F.2d 1052, 1057, 172 USPQ 298, 301-2 (CCPA 1972), and obviousness cannot be established by locating references which

describe various aspects of appellant's invention without also providing evidence of the motivating force which would impel one skilled in the art to do what appellants have done. Ex parte Levengood, 28 USPQ2d 1300, 1302 (Bd. App. & Int. 1993). Here the Office Action fails to present any persuasive evidence of such a motivating force.

Furthermore, turning to Fig. 5I of Han, Han's storage capacitor 130 is disposed on the ohmic contact layer 112. This is in contradistinction to what is recited in claims 1, 2 and 5, i.e., wherein the second storage electrode is disposed directly contacting the gate insulation layer. So, even if one of ordinary skill in the art were properly motivated to modify Akamatsu in view of Han as suggested (which is not proper for the reasons presented above), the resulting reference combination would not result in, or render obvious, the claimed invention.

Accordingly, Applicants respectfully submit that this rejection of claims 1, 2 and 5 is improper and should be withdrawn.

The Office Action rejects claims 6-9 and 11 under 35 U.S.C. § 103(a) as unpatentable over Han in view of U.S. Patent 6,025,605 to Lyu. This rejection is respectfully traversed.

The Office Action alleges that Han discloses the features recited in claims 6-9 and 11 except for the alignment of the ends of the thin film transistor with the ends of the source and drain electrodes and being located below the source and drain electrodes. The Office Action relies on Lyu for disclosure of a semiconductor



layer and an ohmic contact layer having ends lined with and directly below corresponding ends of the source electrode and drain electrode. The Office Action concludes that it would be obvious to modify Han to provide such a feature "for the purpose of simplifying the production process and reducing manufacturing costs."

Applicants respectfully submit that this alleged motivation is not supported by objective evidence of record and is improperly based solely on speculation unsupported by objective evidence of record.

In the first place, Lyu discloses that the ends of the second metal layer 143, the n-plus semiconductor layer 139 and semiconductor layer 137 are aligned in col. 3, lines 55-62. No reason for forming them in that manner is stated. All that is stated is "[S]econd metal layer 143, n-plus semiconductor layer 139, and semiconductor layer 137 are then patterned into a desired shape, as shown in Fig. 3F."

No reason is given by Lyu to explain why this shape is desired.

More particularly, there is no disclosure in Lyu that the desired shape is achieved for the purpose of simplifying the production process and/or for reducing manufacturing costs.

These reasons are based purely on speculation by the Examiner and are not supported by any objective evidence of record.

The conclusion in the "Response to Arguments" section of the Office Action that "it is very well known in the art that having the ends aligned as claimed means

that the device can be made with fewer masking steps.” No objective factual evidence has been presented to support this conclusion, as required by existing case law. A factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusionary statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

As is well settled, a rejection based on §103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection advanced. An Examiner may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis, See, In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968).

Thus, the alleged motivation for combining these references, which is wholly speculative and not supported by objective evidence, is improper.

Additionally, contrary to the position of the Office in this rejection, Applicants respectfully submit that Han does not disclose “the passivation layer pattern exposing a portion of a side surface of the drain electrode” and “wherein a portion of the pixel electrode is formed directly on the gate insulation film at a pixel region defined by the gate and data lines.”

Applicant believes that Han discloses that the first and second passivation layer 113a and 113b has the contact hole 116 exposing a top surface of drain

electrode 106, not the side surface. Moreover, the pixel electrode 104 of Han does not appear to be in contact with the gate insulating layer 109.

So, even if one of ordinary skill in the art were properly motivated to modify Han in view of Lyu, as suggested (which is not proper for the reasons presented above), the resulting reference combination would not result in, or render obvious, the claimed invention.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of the claimed invention.

Reconsideration and withdrawal of this rejection of claims 6-9 and 11 is respectfully requested.

Claims 12-14 and 22 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent Application Publication 2001/0019376 to Kim in view of Lyu. This rejection is respectfully traversed.

At the outset, Applicants note that claim 13 was previously canceled, and therefore, the inclusion of claim 13 in this rejection is improper.

The Office Action clearly, unmistakably and unequivocally admits that Kim's semiconductor layer and ohmic contact layer ends are not aligned with or directly below the corresponding ends of the drain electrodes. The Office Action relies on Lyu for disclosure of a semiconductor layer and an ohmic contact layer having ends lined with and directly below corresponding ends of the source electrode and drain electrode. The Office Action concludes that it would be obvious to modify

Kim to provide such a feature “for the purpose of simplifying the production process and reducing manufacturing costs.”

Applicants respectfully submit that this alleged motivation is not supported by objective evidence of record and is improperly based solely on speculation unsupported by objective evidence of record.

In the first place, Lyu discloses that the ends of the second metal layer 143, the n-plus semiconductor layer 139 and semiconductor layer 137 are aligned in col. 3, lines 55-62. No reason for forming them in that manner is stated. All that is stated is “[S]econd metal layer 143, n-plus semiconductor layer 139, and semiconductor layer 137 are then patterned into a desired shape, as shown in Fig. 3F.”

No reason is given to explain why this shape is desired.

More particularly, there is no disclosure in Lyu that the desired shape is achieved for the purpose of simplifying the production process and/or for reducing manufacturing costs.

These reasons are based purely on speculation by the Examiner and are not supported by any objective evidence of record.

As is well settled, a rejection based on 35 U.S.C. §103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection advanced. An Examiner may not, because of doubts that the invention is patentable, resort to speculation,

unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See, In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968).

Additionally, as noted above, the conclusion in the “Response to Arguments” section of the Office Action that “it is very well known in the art that having the ends aligned as claimed means that the device can be made with fewer masking steps,” no objective factual evidence has been presented to support this conclusion, as required by existing case law. A factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Examiner. See, In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

Thus, the alleged motivation for combining these references, which is wholly speculative and not supported by objective evidence, is improper.

Further, Applicants have reviewed the Kim reference and do not believe that Kim discloses “where the pixel electrode is formed directly contacting the gate insulator at a pixel region defined by the gate and data lines,” or “wherein the pixel electrode contacts side portion of the semiconductor layer and one of the first and second ohmic contact layers, as currently recited in claim 1.

So, even if one of ordinary skill in the art were properly motivated to modify Kim in view of Lyu, as suggested (which is not proper for the reasons presented above), the resulting reference combination would not result in, or render obvious, the claimed invention.

Accordingly, the Office Action fails to make out a *prima facie* case of obviousness of the claimed invention.

Reconsideration and withdrawal of this rejection of claims 12, 14 and 22 is respectfully requested.

### CONCLUSION

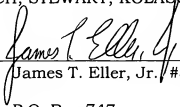
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert J. Webster, Registration No. 46,472, at the telephone number of the undersigned below, for example, to conduct an interview in an effort to resolve the outstanding matters and to expedite prosecution of the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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